



**REMEDIAL INVESTIGATION WORK PLAN
FOR AREA A**

**Getty Refining and Marketing Inc.
86 Doremus Avenue
Newark City, Essex County
IRSA Case No. E84455**

Prepared for:

**Chevron Environmental Management Company
6001 Bollinger Canyon Road
San Ramon, CA 94583**

October 7, 2003

QUEST

**Environmental & Engineering
Services, Inc.**

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Quest Environmental & Engineering Services, Inc.
1741 Route 31
Clinton, New Jersey 08809**

October 7, 2003

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1.0 INTRODUCTION

This Remedial Investigation Workplan ("RIW") has been prepared by Quest Environmental & Engineering Services, Inc. ("Quest") on behalf of Chevron Environmental Management Company ("Chevron") for the Getty Petroleum Marketing Inc. Terminal located at 86 Doremus Avenue, Newark, New Jersey. The location and plan of the Site are shown on Figures 1 and 2, respectively. The RIW addresses the remaining investigation of soil in an area of concern ("AOC") designated as Area A, which is a 2.5-acre undeveloped parcel located in the southern portion of the Terminal's West Yard (Figure 2). The remedial investigation has been developed to supplement existing data for implementation of a remedial action plan involving construction of a soil cap (containment/engineering control), installation of perimeter fencing, and the application of a Deed Notice. This RIW specifies the field sampling plan and the sampling procedures to be used.

This RIW was prepared pursuant to the requirements appearing in the New Jersey Technical Requirements of Site Remediation (N.J.A.C. 7:26E-4). This RIW is organized into five sections with accompanying tables, figures and appendices. Section 2 provides background on current site conditions, site history, geology/hydrogeology, and previous remedial actions. Section 3.0 provides the project organization, and Section 4.0 describes the field sampling plan including the sampling procedures and analytical methods. A schedule of the remedial investigation is provided Section 5.0.

2.0 SITE BACKGROUND

The following sections provide a site description, history, geology and hydrogeology, prior remedial activities, and soil conditions.

2.1 Site Location and Description

The Getty Newark Terminal is a 14.5-acre petroleum storage facility located at 86 Doremus Avenue in Newark, Essex County, New Jersey (Figure 1). The site comprises two major areas: the East Yard and West Yard, which are situated in respective sides of Doremus Avenue. The subject of this report is Area A, which is an undeveloped 2.5-acre area located in the southern portion of the West Yard. Area A is bounded by industrial properties to the west, south and southeast; Exit 15E of the New Jersey Turnpike to the northwest; and the West Tank Yard to the north and northeast. Area A has not been used for terminal operations.

2.2 Physical Characteristics

The ground surface of Area A is approximately up to eight feet higher in elevation than the adjacent tank basin area to the north. The surface elevations range from nine to fifteen feet above mean sea level. Highest elevations occur within the central portion of Area A. The ground surface generally slopes to lower elevations to the northwest and southeast. Portions of Area A in the central and southwest areas have been excavated during previous soil remedial activities conducted during 1990-1991 and during 1996. The area is largely covered with grasses/weeds with a few trees situated in the northwestern portion and the northern boundary bordering the tank basin area. Ground water ranges from approximately three feet to seven feet deep and flows from west to east.

2.3 Historic Fill

The soil in Area A is composed of approximately two to ten feet of fill material overlying natural soil that consists of dark gray organic clay/silt and brown peat/sand. The fill is composed of a mixture of sand, silt, and gravel with varying amounts of brick fragments, rocks, wood and other debris. Historic aerial photographs of the site provided in a prior report reveal that Area A has

undergone past filling activity, which has raised the ground elevation relative to the adjacent West Tank Yard. The fill is the source of polychlorinated biphenyls ("PCBs") and polycyclic aromatic hydrocarbons ("PAHs"), the primary constituents of concern that exist in soil at concentrations exceeding NJ Soil Cleanup Criteria. Areas of greatest disturbance observed in aerial photographs (i.e. southern perimeter and central portion) encompass the areas of highest contamination by PCBs and PAHs.

2.4 Previous Investigation and Remedial Activities in Area A

The first phase of investigation (Phase I) within Area A was conducted in 1988 during the Phase III ECRA investigation of the site. Eleven soil borings were advanced to the water table and samples collected for analysis of TPHC and Lead. In May 1990 following the February 22, 1990 Remedial Action Plan (RAP) approval for the site, soil exhibiting elevated levels of TPHC and Lead were delineated to the RAP approved cleanup levels. The approved cleanup levels for Area A were:

TPHC	500 ppm
Lead	1,000 ppm
Total Volatile Organic Compounds	1 ppm
Total Base Neutral Compounds	10 ppm

Soils exceeding cleanup levels were excavated for off-site disposal. Analytical results of waste classification samples of the excavated soil indicated the presence of polychlorinated biphenyls (PCBs).

Additional sampling (Phase II) was conducted in November 1990 to delineate/investigate PCBs, TPHC, Lead, base neutrals and volatile organics. Soil with levels of TPHC, PCBs and base neutrals exceeding cleanup levels was excavated. There was no site-specific PCB cleanup level at that time since PCBs were not a constituent of concern when the Remedial Action Plan was approved. However, the previous ECRA cleanup guideline of 5 ppm was used as a cleanup level. Post-excavation samples were collected in January 1991.

Phase III of the remedial activities was performed from May 1991 through September 1991. This phase was implemented to define the extent of TPHC and PCBs exceeding cleanup levels at post-excavation sample locations sampled during Phase II. Once the extent of PCB and TPHC contamination was established, final excavation and loadout of soils were conducted.

Approximately 3,900 tons (approximately 3,000 cubic yards) were excavated within Area A and disposed off site. The results of all excavation, post-excavation sampling, and disposal activities were submitted to the NJDEP in a report prepared by IT Corporation entitled *Area A Closure Report, Newark Terminal, Newark, New Jersey, ECRA Case # 84455*, dated November 1991. In June 1992, the NJDEP rejected approval of no further action because post-excavation sampling was not deemed sufficient to demonstrate cleanup to approved levels, and contamination levels along the southern property line were not considered to be fully delineated.

Additional sampling was conducted during 1993 - 1995 to delineate areas with PCB and PAH levels exceeding NJDEP Direct Contact Soil Cleanup Criteria. The results of the sampling were reported in an IT Corporation report entitled, *Area A Phase IV Soil Sampling Results (June 1993)* and a Quest report entitled *Soil Sampling Results in Area A and the East Paved Yard (September 1995)*. The results indicated "hot spot" areas of PCBs (20 - 40 ppm) in central and southern portions of Area A and concentrations of carcinogenic PAHs (e.g. benzo(a)pyrene and benzo(a)anthracene) within most areas of Area A. In addition, off-site revealed elevated PCBs and PAH concentrations on an adjacent property south of Area A supporting a historic fill source for these contaminants in this area. Based on the data generated from the investigations, hot-spot areas of soil containing elevated PCB concentrations (>20 ppm) were excavated in November 1996 and disposed off site in April 1997. Approximately 150 cubic yards of additional soil were excavated and removed from the site. The remediation was documented in a Quest Report entitled, *Remedial Action Report for PCB Soils in Area A (July 25, 1997)*.

2.5 Current Site Conditions After Remediation Activities

2.5.1 Soil

Constituents of concern currently remaining in Area A that exceed Soil Cleanup Criteria ("SCC") are summarized in the following table and are shown in Figures 3, 4, and 5.

Constituent	Concentration Range Exceeding SCC (mg/kg)	Residential SCC (mg/kg)	Non-Residential SCC (mg/kg)	Impact to GW SCC (mg/kg)
PCBs (total)	0.5-16	0.49	2	50
<u>PAHs</u>				
Benzo(a)pyrene	0.7-26	0.66	0.66	100
Benzo(b)fluoranthene	0.96-4.2	0.9	4	50
Benzo(k)fluoranthene	0.91-2.8	0.9	4	500
Benzo(a)anthracene	1.1-3.1	0.9	4	500
Indeno(1,2,3-cd)pyrene	0.92-1.4	0.9	4	500
TPH	19,800 9 (one sample)	10,000	10,000	10,000
Lead	400 - < 1,000	400	600	na

None of the constituents listed in the table exceeds the Impact to Ground Water SCC. PCBs greater than the NJDEP Non-Residential SCC of 2 mg/kg are detected at some locations along the southern property boundary and the interior portion of Area A. Highest concentrations are detected off site along the southern property boundary. Levels appear to decrease to the north away from the property boundary and are generally higher in surface soil than in deeper intervals. Carcinogenic polycyclic aromatic hydrocarbons (CaPAHs) listed in the table also exceed Non-Residential SCC. Benzo(a)pyrene (BaP) is the most strictly regulated of these CaPAHs, having Non-Residential SCC of 0.66 mg/kg. It is found to be above the Non-Residential SCC at a number of sample points across Area A. Concentrations are detected up to 4.2 mg/kg with the average concentration of detection of approximately 1.1 ppm. The distribution of the PAHs does not follow as predictable a pattern as do PCBs. Levels vary from area to area and with depth, which is characteristic of a historic fill source.

One sidewall sample (SW-4) contained an elevated TPH concentration of 19,800 mg/kg of TPH, which exceeds the Soil Cleanup Criterion of 10,000 mg/kg. All other samples indicated low concentrations, generally less than 2,000 mg/kg. Lead was detected at some locations exceeding the Residential (400 mg/kg) and Non-Residential (600 mg/kg) soil cleanup criteria. Concentrations are less than the initially approved cleanup level of 1,000 ppm at all sample locations with the exception of SW-6, which contained 1,205 mg/kg of Lead.

The extent of fill/soil that exceeds soil cleanup criteria is estimated to be approximately 2 acres, ranging 2 – 7 feet in thickness. The estimated volume is 7,000 cubic yards. This volume is comprised entirely of historic fill.

2.5.2 Ground Water

One monitor well, MW-15, is located in the southwest quadrant of Area A and represents the furthest upgradient well for the site. This well was last sampled during December 1999 for volatile organic compounds and base neutral compounds during the prior semi-annual sampling program. Low concentrations of toluene, and xylenes and a few base neutral compounds were detected. Concentrations were less than Class IIA Ground Water Quality Standards.

VOC/BN (ug/L)	MW-15	NJ Class IIA GWQS
Toluene	5	1,000
Xylenes	1.1	1,000 (interim specific)
Acenaphthene	2	400
Diethyl phthalate	0.57	5,000
Fluorene	1	300
Naphthalene	1.1	300 (interim specific)

These VOCs and BNs may be from an off-site source due to the upgradient location of MW-15.

3.0 PROJECT ORGANIZATION

NJDEP is the lead agency for the remedial investigation ("RI") and will approve associated work, as required, prior to implementation. Chevron is responsible for ensuring the remediation requirements of Area A under ISRA Case No. E84455 are met and for management of Quest. Quest has the overall responsibility for conducting the remedial investigation. The general responsibilities of the key organizations involved are described below:

1) NJDEP Case Manager

- a) oversight of the RIW to ensure compliance with NJDEP regulations;
- b) approval of associated work plans and reports, as appropriate; and
- c) coordination of activities with the local community and support agencies, if required.

2) Responsible Party: Chevron - Project Coordinator

- a) oversight of the project to ensure that the RIW objectives are met;
- b) coordination of communications with NJDEP; and
- c) managerial guidance, relative to the RIW and to Quest.

3) Technical Consultant: Quest - Project Manager

- a) preparation of required deliverables;
- b) performing or supervising the implementation of the RI; and
- c) procurement of all subcontractors, as directed and approved by Chevron as required for implementation of the RI tasks.

4.0 FIELD SAMPLING PLAN

The remedial investigation will be conducted in accordance with N.J.A.C. 7:26E-4.1 and 4.3 (Technical Requirements for Site Remediation). The objective of the RI is to delineate the vertical extent of PCB, PAH and Lead contamination within Area A and ascertain the levels of PCB, PAH and Lead contamination at the perimeter of Area A necessary for recording in a Deed Notice. Levels of TPH are well characterized and do not warrant further sampling.

4.1 Soil Investigation

Figure 6 shows proposed sample locations, and Table 1 summarizes the RI sampling and analysis program.

Perimeter Samples

Fourteen perimeter soil borings designated as A-1 through A-14 will be completed at locations along the perimeter of Area A. Samples collected from these boring locations will supplement existing soil sample data and fill data gaps. Most sample locations are located along the eastern, northern, and western boundaries where there is limited soil quality data. The surface interval (0-0.5 ft) will be collected from each sample location. A deeper interval sample also will be collected at approximately every other sample point for vertical characterization in the fill at the perimeter. Samples will be collected using a hand auger or Geoprobe as indicated in Table 1. Samples will be analyzed for PCBs, PAHs, and/or Lead. Samples A-1 through A-4 will not include Lead as an analytical parameter because previous boring locations SB-6, SB-7, SB-11, I-2 and I-3 indicate low levels of Lead throughout the fill within the eastern portion of Area A. Samples from A-11, A-12, and A-13 will be analyzed for PAHs or Lead (A-11) to fill data gaps for these parameters along the southern property boundary.

Vertical Extent Samples

Four soil borings (A-16, A-17, A-18, and A-19) will be completed within the central portions of Area A and advanced to the depth of natural soil. These borings will provide information on the depth and elevation of the natural soil/fill interface. In addition, samples will be collected from the surface interval of the natural soil for vertical delineation of PCBs, PAHs, and Lead. All vertical extent and perimeter samples locations will be surveyed for horizontal and vertical control.

4.2 Soil Sampling Procedures

Boring installation and soil sampling procedures are described in Appendix A. Procedures for maintaining quality assurance and quality control of the field sampling are provided in Appendix B. Table 2 provides a summary of the analytical methods, sample container requirements, and preservation methods.

4.3 Remedial Investigation Report

Upon completion of the soil investigation, a Remedial Investigation Report (RI Report) will be submitted to NJDEP in accordance with the requirements N.J.A.C. 7:26E-4.8, including electronic data deliverables (EDD).

5.0 PROJECT SCHEDULE

The proposed schedule for RI Work Plan activities is presented on Figure 7. The schedule includes the general duration and sequence for sampling, laboratory analysis, data evaluation, preparation of the RI Report/ Remedial Action Plan, and NJDEP review. Changes in the scope of field activities and/or delays due to unforeseen circumstances will cause the schedule to change accordingly. A revised schedule with assigned target dates will be prepared and submitted following approval of this RIW.

TABLE 1
Soil Sample and Analysis Summary
Area A Remedial Investigation
Getty Newark Terminal
ISRA Case No. E84455

Sample	Matrix	Depth (ft)	Collection Method	Analytical Parameters	Rationale
A-1	Soil	0 - 0.5	Geoprobe	PCBs, PAHs	Perimeter Investigation
A-2	Soil	0 - 0.5 4 - 4.5	Geoprobe	PCBs, PAHs	Perimeter Investigation
A-3	Soil	0 - 0.5 4 - 4.5	Hand Auger	PCBs, PAHs	Perimeter Investigation
A-4	Soil	0 - 0.5	Geoprobe	PCBs, PAHs, Lead	Perimeter Investigation
A-5	Soil	0 - 0.5 4 - 4.5	Hand Auger	PCBs, PAHs, Lead	Perimeter Investigation
A-6	Soil	0 - 0.5	Geoprobe	PCBs, PAHs, Lead	Perimeter Investigation
A-7	Soil	0 - 0.5 3 - 3.5	Geoprobe	PCBs, PAHs, Lead	Perimeter Investigation
A-8	Soil	0 - 0.5	Geoprobe	PCBs, PAHs, Lead	Perimeter Investigation
A-9	Soil	0 - 0.5 1 - 1.5	Hand Auger	PCBs, PAHs, Lead	Perimeter Investigation
A-10	Soil	0 - 0.5	Geoprobe	PCBs, PAHs, Lead	Perimeter Investigation
A-11	Soil	0 - 0.5	Hand Auger	PAHs, Lead	Perimeter Investigation
A-12	Soil	0 - 0.5 4 - 4.5	Geoprobe	PAHs	Perimeter Investigation
A-13	Soil	0 - 0.5	Hand Auger	PAHs	Perimeter Investigation
A-14	Soil	0 - 0.5 4 - 4.5	Hand Auger	PCBs, PAHs, Lead	Perimeter Investigation
A-15	Soil	8 - 8.5 (est) (natural soil)	Geoprobe	PCBs, PAHs, Lead	Vertical Extent
A-16	Soil	7 - 7.5 (est)	Geoprobe	PCBs, PAHs, Lead	Vertical Extent
A-17	Soil	6 - 6.5 (est) (natural soil)	Geoprobe	PCBs, PAHs, Lead	Vertical Extent
A-18	Soil	2.5 - 3 (est) (natural soil)	Geoprobe	PCBs, PAHs, Lead	Vertical Extent

PCBs = Polychlorinated Biphenyls
PAHs = Polycyclic Aromatic Hydrocarbons

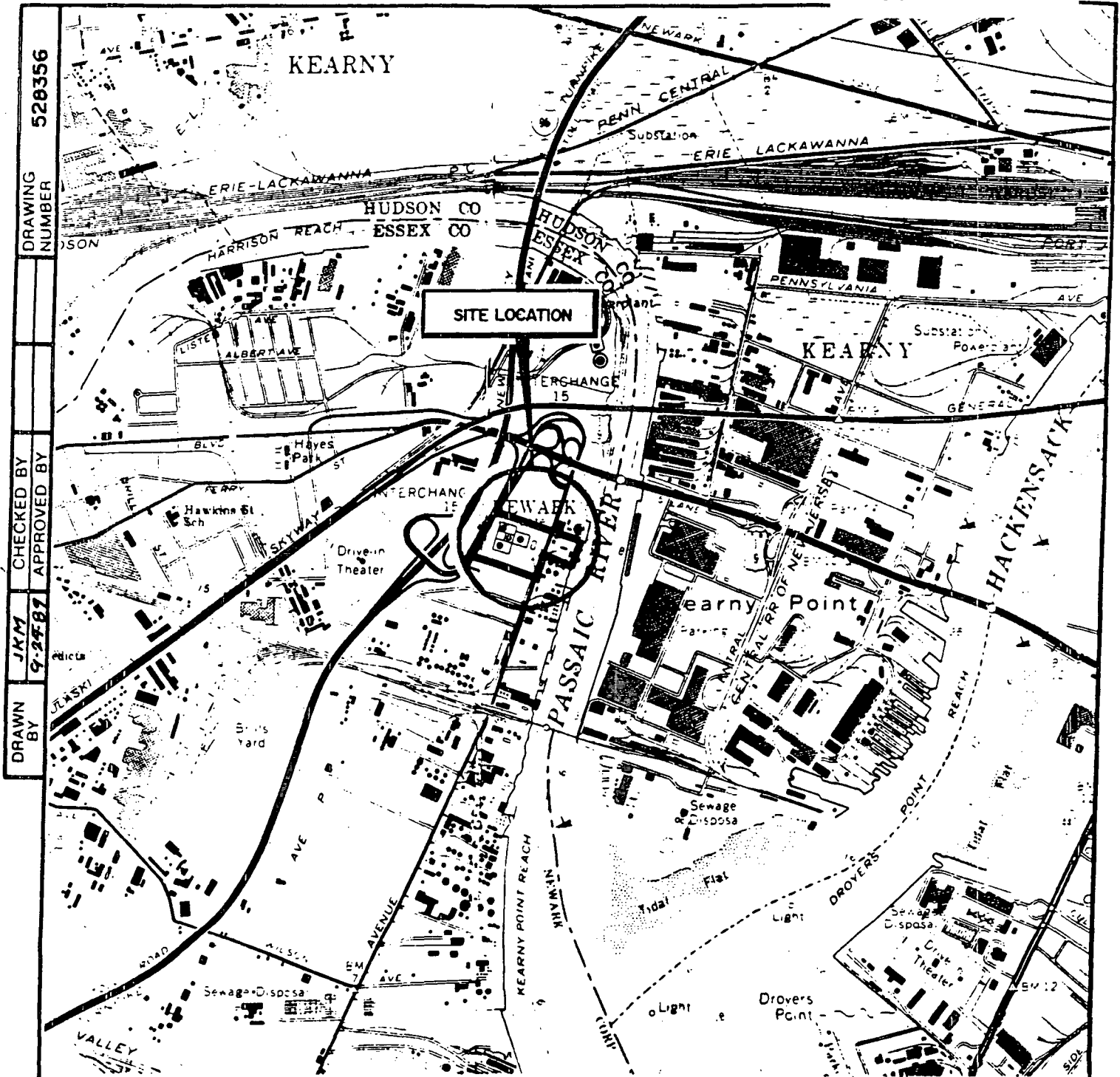
TABLE 2
Sample Containers, Preservation, and Holding Times
Area A Remedial Investigation
Getty Newark Terminal
ISRA Case No. E84455

Sample Containers, Preservation, and Holding Times

Parameter	Matrix	Method	Bottle Type	Preservation	Holding Time
PCBs	Soil	SW-846 8082	250-ml glass jar with Teflon®-lined lid.	Cool to 4° C.	14 days to extraction, 40 days to analysis
PAHs	Soil	SW-846 8270	250-ml glass jar with Teflon®-lined lid.	Cool to 4° C.	14 days to extraction, 40 days to analysis
Lead	Soil	SW-846 6010	250-ml glass jar with Teflon®-lined lid.	Cool to 4° C.	180 days to analysis
PCBs	Water (field blank)	EPA 608	1-Liter Amber Glass Jar (2) with Teflon®-lined Lid	Cool to 4° C.	7 days to extraction, 40 days to analysis
PAHs	Water (field blank)	EPA 625	1-Liter Amber Glass Jar (2) with Teflon®-lined Lid	Cool to 4° C.	7 days to extraction, 40 days to analysis
Lead	Water (field blank)	EPA 200.7 ICP	500-ml Polyethylene Jar and Lid	HNO ₃ to pH <2 , Cool to 4° C.	6-months to analysis

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FIGURES



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC SERIES
CALDWELL & POMPTON PLAINS, NJ QUADRANGLES



0' 2000' 4000'



FIGURE 1

SITE LOCATION

Prepared For:
Chevron Environmental Management Co.

**Quest Environmental &
Engineering Services, Inc.**

NEW JERSEY TURNPIKE

GETTY NEWARK TERMINAL

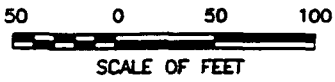
EAST YARD

WEST YARD

DOREMUS AVENUE

PASSAIC RIVER

AREA A



LEGEND:

----- PROPERTY LINE

Quest Environmental & Engineering Services, Inc.

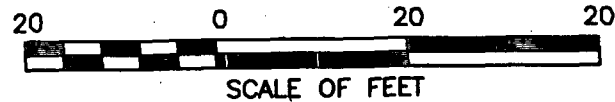
FIGURE 2

SITE MAP

CLIENT NO.	FILE NO.	CHK'D:	DRAWING NUMBER	REV. NO.
11001	-	ENG.	FSITEMAP	
		APP'D.		

NOTICE ABOUT UNSCANNABLE MAP

THIS MAP CAN BE FOUND IN THE SITE FILE LOCATED AT: U.S. EPA SUPERFUND RECORDS CENTER, 290 BROADWAY, 18TH FLOOR, NY, NY 10007. TO MAKE AN APPOINTMENT TO VIEW THE MATERIAL PLEASE CONTACT THE RECORD CENTER AT (212) 637-4308.



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**FIGURE 3
AREA A PCB REMAINING SOIL SAMPLE CONCENTRATIONS
GETTY NEWARK TERMINAL**

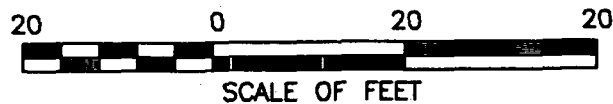
Prepared For:
**CHEVRON ENVIRONMENTAL
MANAGEMENT COMPANY**

CLIENT NO.	FILE NO.	CHK'D:	DRAWING NUMBER	REV. NO.
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**FIGURE 4
AREA A PAH SOIL SAMPLE LOCATIONS AND RESULTS
GETTY NEWARK TERMINAL**


Prepared For:
CHEVRON ENVIRONMENTAL
MANAGEMENT COMPANY

CLIENT NO.	FILE NO.	CHK'D:	DRAWING NUMBER	REV. NO.
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 SCALE OF FEET				
Quest Environmental & Engineering Services, Inc. 1741 Route 31, Clinton, NJ 08809 (908)730-7707				
FIGURE 5 TPH AND LEAD SAMPLE RESULTS GETTY NEWARK TERMINAL Prepared For: CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY				
CLIENT NO.	FILE NO.	CHK'D:	DRAWING NUMBER	REV. NO.
12001	10	ENG.	F-TPH	
		APPVD.		

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 SCALE OF FEET				
Quest Environmental & Engineering Services, Inc. 1741 Route 31, Clinton, NJ 08809 (908)730-7707				
FIGURE 6 REMEDIAL INVESTIGATION SAMPLE LOCATIONS GETTY NEWARK TERMINAL Prepared For: CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY				
CLIENT NO.	FILE NO.	CHK'D:	DRAWING NUMBER	REV. NO.
12001	10	ENG. APPVD.	F-REMED	

932990022

FIGURE 7
REMEDIAL INVESTIGATION WORK PLAN SCHEDULE
GETTY PETROLEUM MARKETING INC. - NEWARK, NEW JERSEY
ISRA CASE No. E84455

	Months											
Activity	1	2	3	4	5	6	7	8	9	10	11	12
- Receipt of RI Workplan Approval	■											
- Soil Sampling		■										
- Laboratory Sample Analysis		■										
- Receive and Evaluate Results			■									
- Prepare RI Report and Remedial Action Plan			■									
- Submit RI Report and Remedial Action Plan				■								
- NJDEP Review				■	■	■	■					
- Implement Remedial Action Plan							■					

APPENDIX A

Soil Boring and Sampling Procedures

Appendix A - Soil Sampling Procedures

A.I Hand Auger Soil Sampling

Surface and shallow subsurface soil samples will be collected manually using a stainless steel bucket auger.

Materials

The following materials, as required, will be available during surface soil sampling:

- Personal protective equipment (as required by the Health and Safety Plan)
- Cleaning equipment
- Aluminum or stainless steel tray
- Field notebook
- Appropriate sample containers and forms
- Insulated coolers with ice
- Stainless steel bucket auger
- Spatula or knife
- 6-foot rule and 100-foot measuring tape
- Stainless steel spatulas
- Camera and film

Procedures

The following procedures will be employed to collect soil samples:

1. Don personal protective equipment (as required by the Health and Safety Plan).
2. Identify proposed sample location from the sample location plan and note location in field notebook.
3. Clean the sampling equipment in accordance with the procedures outlined in Appendix B (QAPP) of this RIW.
4. If the sample location is a vegetated area, the vegetation should be removed prior to collecting the soil sample(s).
5. At each sample location, advance a pre-cleaned stainless steel bucket auger with a straight, vertical entry into the soil, so as to secure a reasonably representative sample. Measure and record the depth of soil penetrated noting the beginning and end depth of the sample.
6. Remove the sampler and place on an aluminum or stainless steel tray.

7. With a pre-cleaned spatula or knife, remove all excess soil from the outside of the sampler to avoid cross-contamination over the sample depth.
8. Extrude the sample onto a stainless steel tray. Describe and record sample descriptions. Mix sample increments thoroughly.
9. Place the sample in the appropriate sample jar.
10. Record all appropriate information in the field notebook per Appendix B (QAPP) of this RIW.
11. Label, handle, pack and ship the samples in accordance with the procedures outlined in Appendix B of this RIW.

A.2 Geoprobe Soil Boring Completion and Sample Collection Procedures

Soil borings will be completed with a Geoprobe sampling device to collect subsurface soil samples at discrete depth intervals.

Equipment Cleaning

Equipment will be cleaned prior to use on the site, between each drilling location, and prior to leaving the site. All drilling equipment and associated tools, including augers, drill rods, sampling equipment, wrenches and other equipment or tools that may have come in contact with soils and/or waste materials, will be cleaned using a potable water source. The drilling equipment will be cleaned in an area adjacent to the work zone.

Drilling Procedures, Equipment and Records

All equipment and materials that may be required to advance the soil borings and sample encountered materials, as described, will be available during the boring and sampling operations. Required equipment and materials include drilling machinery in good working order equipped for the season of operation; sample containers and forms; sampling, screening and cleaning equipment and supplies; and supplies and equipment to comply with all site and Health and Safety procedures.

The Drilling Contractor will be responsible for obtaining accurate and representative samples, informing the field technician of changes in drilling pressure, and keeping a separate general log

of soils encountered. Records will also be kept of occurrences of premature refusal due to boulders or construction materials, which may have been used as, fill. Where a boring cannot be driven to the desired depth, equipment will be relocated in order to obtain the required sample. Multiple refusals may lead to a decision by the field technician to abandon that sampling location.

The field technician will be responsible for documenting drilling events using a soil-boring log recording all relevant information in a clean and concise format. As an alternative, a bound field notebook may be used at the discretion of field personnel to document field activities, provided that the information is concisely presented in the notebook. The record of drilling events will include but not be limited to:

- 1) start and finish dates of drilling;
- 2) name and location of project;
- 3) project number, client and site location;
- 4) sample number and depths;
- 5) soil core recovery;
- 6) depth to water;
- 7) type of drilling method;
- 8) auger size;
- 9) documentation of any elevated organic vapor emissions;
- 10) names of contractor's drillers, inspectors, or other people on-site; and
- 11) weather conditions.

Soil Sample Collection Procedure

Using the Geoprobe Rig, borings are to be installed by driving a 2-inch diameter stainless steel core into the ground with a truck or track-mounted percussion hammer and hydraulic jack. Soil samples are collected at discrete intervals using 2-inch diameter, 5-foot long stainless steel core barrels with single-use acetate liners. When the closed sample tube is driven to the desired depth, an extension rod is lowered through the stainless steel rods to open the end of the sample tube. After being opened, the sample tube is driven five (5) feet to collect a soil core, then retrieved by removing the probe rods.

Upon collection, all sample containers will be labeled and all appropriate information in the field notebook recorded per Section 4 of this RIW. Those samples selected for laboratory analysis will be handled, packed and shipped in accordance with the procedures set forth in Appendix B.

A technician will be on-site during drilling and sampling operations to fully describe each soil sample on the soil boring log, including:

1. Percent recovery;
2. Structure and degree of sample disturbance;
3. Soil type;
4. Color;
5. Moisture condition;

6. Density;
7. Grain size;
8. Consistency; and
9. Any other observations, particularly relating to the presence of waste materials or contaminants.

Particular care will be taken to fully describe any sheens observed, oil saturation, evidence of other organic chemicals, or unnatural materials.

Collect the soil sample as described in Section A.1 above.

A.3 Disposal Methods

Personal protective equipment, such as gloves, disposable clothes, and other disposable equipment, resulting from personnel cleaning procedures and from soil sampling and handling activities, will be placed in plastic bags. These bags will be transferred into appropriately labeled 55-gallon drums or a covered roll-off box for appropriate disposal.

Soil material will be placed back into the area from which it was obtained. All decontamination water will be allowed to infiltrate soils.

APPENDIX
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APPENDIX B

Quality Assurance Project Plan

Appendix B - Quality Assurance Project Plan

This Quality Assurance Project Plan ("QAPP") presents the organization, objectives, functional activities, and specific Quality Assurance ("QA") and Quality Control ("QC") activities associated with the sampling activities specified in the *Remedial Investigation Workplan*. This QAPP also describes the specific protocols that will be followed for sample handling, chain-of-custody, and laboratory analyses.

B.1 PROJECT MANAGEMENT

This section describes the administrative functions, project objectives, and approaches to be followed for the remedial investigation.

A.1 Project/Task Organization

Quest Environmental & Engineering Services, Inc. (Quest) maintains overall technical responsibility for conducting the sampling activities specified in the Remedial Investigation Workplan (RIW). As such, Quest will perform field sampling, tabulate and evaluate the data, and provide QA/QC oversight. The management of technical and administrative aspects of the project will be accomplished by Chevron, Quest, and the NJDEP.

To date, the following key personnel are assigned to the project:

Affiliation	Title	Name	Telephone Number
Chevron Env. Mgmt. Co.	Project Coordinator	Jon Baldwin	(925) 842-2132
Quest Environmental	Project Manager	Ken Swider	(908) 735-8600
NJDEP	Case Manager	Alphonse Inserra	(609) 633-1413

A.2 Project Objectives

The purpose of the remedial investigation ("RI") is to delineate the vertical extent of PCB and PAH contamination within Area A and ascertain the levels of PCB and PAH contamination at the perimeter of Area A.

A.3 Data Quality Objectives

Data Quality Objectives ("DQOs") are qualitative and quantitative statements that specify the quality of the data required to support decisions made during site-related activities and are based on the end uses of the data to be collected. As such, different data uses may require different levels of data quality. For this RI, the level of data quality will be the Definitive Data category. Definitive data are generated using analytical methods, such as approved USEPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce raw data (e.g., chromatograms, spectra, digital values) in the form of paper printouts or computer-generated electronic files. Criteria employed to meet the data quality objective include accuracy, precision, completeness, representativeness, and comparability, which are standard assessments applied to analytical data by the laboratory per USEPA analytical methods.

A.4 Special Training/Certifications

Field personnel will adhere to the procedures specified in a Health and Safety Plan (HSP) and will have met the following requirements prior to performing field sampling:

- 40-hour training course that meets the requirements of 29 CFR Part 1910.120(e) on health and safety at hazardous waste sites; and
- 8-hour refresher course within the last 12 months that meets the requirements of 29 CFR Part 1910.120(e) on health and safety at hazardous waste sites.

The Project Manager will be responsible for ensuring that field personnel have current health and safety training. Field personnel will be properly trained in equipment use and procedures necessary for field sampling prior to entering the field. The requirements of the QAPP will be reviewed by management and field personnel to ensure that persons with appropriate credential and experience are assigned to the tasks to be performed. It will be the responsibility of the Project Manager to ensure that field personnel understand and comply with the applicable QAPP requirements.

A.5 Documentation and Records

This QAPP will be distributed to all personnel responsible in the collection of field samples. Analytical data will be reported in an analytical data package (NJ Reduced Deliverables) and in an Electronic Data Deliverable (EDD) in accordance with the NJDEP HAZSITE Database. Data packages will be provided as a paper copy and in an Adobe® Acrobat® .pdf electronic format, if requested.

Appropriate records will be maintained to provide adequate documentation of the remedial investigation. Appropriate records include:

- field records including description of daily activities, boring logs and photographs;
- laboratory data deliverables;
- custody documentation; and
- results reports and drawings.

B. DATA GENERATION AND ACQUISITION

This section describes the procedures for sample collection, handling, and field quality control.

B.1 Sampling Process Design

The sample network design and rationale for sample locations are described in detail in Section 4 of the RIW. The sampling will involve the collection of soil samples. Sample matrices, analytical parameters and frequencies of sample collection can be found in Tables 2 of the RIW.

B.2. Sampling Methods

Soil sampling methods include collecting samples using a hand auger as described in Appendix B of the RIW.

B.3 Sample Handling and Custody

Sample handling and custody involves sample collection, documentation, and shipping.

B.3.1 Field Sample Custody

The objective of field custody is to assure that the samples are not tampered with from the time of collection through time of transport to the analytical laboratory. Field custody documentation consists of both field logbooks and field chain-of-custody forms.

A sample or evidence file is under your custody if it:

- Is in your possession;
- Is in your view, after being in your possession;
- Was in your possession and you placed it in a secured location; or
- Is in a designated secure area.

Field Logbooks

Field logbook will provide the means of recording data-collecting activities performed. As such, entries will be described in as much detail as possible so that persons going to the site could re-construct a particular situation without reliance on memory.

Field logbooks will be bound, field survey books or notebooks. Logbooks will be assigned to field personnel, but will be stored in a secure location when not in use. Each logbook will be identified by the project-specific designation. The title page of each logbook will contain the following:

- Person to whom the logbook is assigned;
- Logbook number;
- Project name;
- Project start date; and
- End date.

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection being used, and the signature of the person making the entry will be entered. The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Measurements made and samples collected will be recorded. All entries will be made in ink and no erasures will be made. If an incorrect entry is made, the information will be crossed out with

a single strike mark. Whenever a sample is collected, or a measurement is made, a detailed description of the location of the station shall be recorded. The number of the photographs taken of the station, if any, will also be noted. All equipment used to make measurements will be identified, along with the date of calibration.

Samples will be collected following the sampling procedures documented in the RIW. The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume and number of containers.

Field Chain of Custody

Completed chain-of-custody (COC) forms will be required for all samples to be analyzed. COC forms will be initiated by the sampling crew in the field. The COC forms will contain the sample's unique identification number, sample date and time, sample description, sample type, preservation (if any), and analyses required. The original COC form will accompany the sample to the laboratory. Copies of the COC will be made prior to shipment (or multiple copy forms used) for field documentation. The COC forms will remain with the samples at all times. The samples and signed COC forms will remain in the possession of the sample crew until the samples are delivered to an express carrier (e.g., Federal Express) or hand delivered to a mobile or permanent laboratory, or placed in secure storage.

B.3.2 Sample Containers and Preservation

A summary of the recommended bottle types and preservation is provided in Table 2 of this RIW. All bottles used will be supplied by the laboratory. The bottles will be purchased pre-cleaned to USEPA Office of Solid Waste and Emergency Response (OSWER) Directive 9240.05A requirements.

B.3.3 Sample Labeling

Preprinted sample labels will be affixed to each sample bottle. The following information is required on each sample label:

- Project;
- Date collected;
- Time collected;
- Location;
- Sampler;
- Analysis to be performed;

- Preservative; and
- Sample number

Sample labels are completed for each sample using waterproof ink unless prohibited by weather conditions.

B.3.4 Sample Packaging and Shipping

Sample packaging and shipment procedures are designed to insure that the sample will arrive at the laboratory, with the COC, intact.

Samples will be packaged for shipment as outlined below:

- Ensure that all sample containers have the sample labels securely affixed to the container with clear packing tape;
- Check the caps on the sample containers to ensure that they are properly sealed;
- Wrap the sample containers in bubble wrap or other cushioning material;
- Place 1 to 2 inches of cushioning material at the bottom of the cooler;
- Place the sealed sample containers into the cooler;
- Place ice in plastic bags and seal. Place loosely in the cooler;
- Fill the remaining space in the cooler with cushioning material;
- Place chain of custody forms in a plastic bag and seal. Tape the forms to the inside of the cooler lid;
- Close the lid of the cooler, lock and secure with duct tape or custody seal. Place a signed custody seal over the cooler lid.

All samples will be hand-delivered within 24 hours of the time of collection. All shipments will be accompanied by the COC form identifying the contents. The original form will accompany the shipment; copies will be retained by the sampler for the sampling office records.

B.4 Analytical Methods

Samples will be analyzed by a New Jersey certified analytical laboratory. Analytical Methods are specified below:

<u>Analyte</u>	<u>Matrix</u>	<u>Method</u>
PCBs	Soil	SW846 8082
PAHs	Soil	SW846 8270
Lead	Soil	SW846 6010B
PCBs	Water	EPA 608
PAHs	Water	EPA 625
Lead	Water	EPA 200.7 - ICP

B.5 Quality Control

All field sampling equipment shall be decontaminated prior to sampling and between sample collection. Field rinse blanks will be collected to provide the means for assessing data quality from the field sampling.

5.1 Field Cleaning/Decontamination Procedures

The following describes the procedure to be used to decontaminate sampling equipment.

Materials

- Distilled water
- Non-phosphate soap (e.g. Alconox)
- Tap water
- Rinse collection plastic containers
- Knife
- Brushes
- Aluminum foil
- Garbage bags
- Spray bottles
- Ziploc type bags
- Plastic sheeting

Cleaning Procedures

Cleaning of reusable sampling equipment (e.g., scoops, mixing bowls, spatulas, etc.), will follow the decontamination procedures presented below:

- a. Non-phosphate detergent and tap water wash with a brush;
- b. Tap water rinse;
- c. Distilled water rinse;
- d. Allow to air dry and wrap in aluminum foil, if appropriate.

Cleaning/decontamination will be conducted in plastic containers that will be transported to each sampling location. These containers will also be used to collect all decontamination rinsate. Collected rinsate will be placed on the ground surface within Area A.

B.5.2 Field Blanks

Field blanks will be used to assess the quality of the data resulting from the field sampling program. Field blank samples are analyzed to check for procedural contamination at the site, which may cause sample contamination. Field blanks will be collected at a rate of one per day from sampling equipment (i.e. hand auger, mixing bowl, spatula etc). Field blanks will be analyzed for all analytical parameters analyzed during the sampling day per sample matrix. Demonstrated analyte-free water obtained from the laboratory will be used for preparation of field blanks. Field blank water shall not be held on site for more than two (2) consecutive calendar days.